

DD 1 JAN 73 1473

EDITION OF 1 NOV 65 IS OBSOLETE S/N 0102-014-6601

UNCLASSIFIED

BOEING VERTOL COMPANY

P.O. BOX 16858 PHILADELPHIA, PENNSYLVANIA 19142

CODE IDENT. NO. 77272

NUMBER ______D210-11114-1

TITLEPreli	minary Integrated Logi	stics Support
Plan for Ext	ernally Mounted Automa	tically Expelled/
Inflated M	ultiplace Life Raft fo	or Helicopters
SUBSEQUENT RE	ASE DATE FOR EVISIONS, SEE THE REVISION SHEED ISTRIBUTION AND USE OF INT, SEE THE LIMITATIONS SHEED.	MEET. FOR LIMITATIONS NEORMATION CONTAINED
MODEL H-	46 CONTRACT	
ISSUE NO.	ISSUED TO:	
PREPARED BY	Tuking Sa (King)	DATE _7-26-76
APPROVED BY	Cilia	DATE 7/27/76
APPROVED BY	G. W. Windolph	DATE 8-9-76

DISTRIBUTION STATEMENT A

Approved for public release: Distribution Unlimited

FORM 46280 15/731

APPROVED BY

SHEET 1

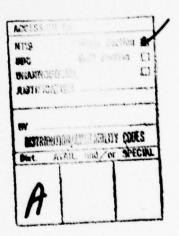
78 07 31 048

DATE _____

THE DOENNE COMPANY

NUMBER D210-11114-1 REV LTR

LIMITATIONS



This document is controlled by Product Assurance/GSE Organization No 7930

All revisions to this document shall be approved by the above noted organization prior to release.

FORM 46281 (3:67)

ACTIVE SHEET RECORD														
		ADDED SHEETS					ADDED SHEETS				ADDED SHEETS			
SHEET	REV LTR	SHEET NUMBER	REV LTR	SHEET NUMBER	REV LTR		SHEET	REV LTR	SHEET NUMBER	REV LTR	SHEET NUMBER	REV LTR		
1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22.														

FORM 46283 (7/67)

	REVISIONS		
LTR	DESCRIPTION	DATE	APPROVAL
FORM 462 62	(5/62)		

ABSTRACT

This document defines the Preliminary Integrated Logistics Support Plan (PILS) which describes the support requirements; provisioning, procurement, and acquisition of parts, equipment and facilities; and performance of support activities for and during the "externally mounted, automatically expelled/inflated multiplace life raft for helicopters" development program, "Automated Life Raft" (ALR).

KEY WORDS

Maintenance Engineering Analysis (MEAS)

Contract Maintenance

Support Equipment

Special Test Facilities

Repair Parts

Maintenance Evaluation

Supply Support

Transportation, Packaging Storage and Handling (TPSH)

Training

Management Support

Equipment Publications

Software Analysis Program



TABLE OF CONTENTS

		Page
1.	Introduction	8
2.	Summary	8
3.	Management Support Plan	9
4.	Maintenance Documentation and Analysis Plan	11
5.	Support Equipment Plan .	17
6.	Repair Parts and Supply Support Plan	17
7.	Training Plan	17
8.	Equipment Publications Plan	18
9.	Special Test Facilities	18
10.	Contract Maintenance Plan	18
11.	Maintenance Evaluation Plan	20
12.	Transportation, Packaging, Storage and Handling Plan (TPSH)	21
13.	Life Cycle Cost Consideration	22
L4.	Logistic Support for Operational and Mission Requirements	22



FORM 40284 1. 001

LIST OF FIGURES

Figure		Page
1.	Preliminary Integrated Logistic Support Management Interfaces	12
2.	Schedule for Development Program	13
3.	Life Raft Development Program Maintenance Engineering Analysis Process	14
4.	Boeing VertolTest/Field R&M Report Form	15

INTRODUCTION

This plan describes the Contractor's program for definition of support requirements; provisioning, procurement, and acquisition of parts, equipment, and facilities; and performance of support activities for and during the Automated Life Raft Program. This plan is presented in the general format contained in AR30A with individual sections (plans) tailored to address the Life Raft System Development & Production Program requirements.

The following plans constitute the Contractor's Preliminary Integrated Logistics Support Plan (PILS).

- a. Management Support
- b. Maintenance Documentation and Analysis
- c. Support Equipment
- d. Repair Parts and Supply Support
- e. Training
- f. Equipment Publications
- g. Special Test Facilities
- h. Contract Maintenance
- i. Maintenance Evaluation
- j. Transportation, Packaging, Storage and Handling

2. SUMMARY

One objective in the development of this plan was to make maximum use of the existing support concepts, procedures and resources. As such, the PILS has been structured, in detail, to use logistic support data and analyses developed during the helicopter flotation study and the life raft study, contracts N62269-75-C-0469 and N62269-75-C-0454. Use of these data and analyses precludes duplication of effort and provides the visibility necessary to assure the maximum use of existing logistic resources for the automated life raft study. This approach is summarized as follows:

- a. Maintenance Documentation and Analysis
 - Maintenance concept development is not required. Concepts developed under other programs are used.
 - Maintenance Engineering Analysis (MEA) documentation is minimized to that necessary to satisfy life raft system requirements.
- b. Support Equipment
 - Equipment used to build and install the system will be standard. Peculiar Ground Support Equipmeny (PGSE) will not be required.
- c. Repair Parts and Supply Support
 - Support will be based on actual needs defined by MEA.

d. Training

- Boeing personnel assigned to maintain the automated life rafts will receive their training through participation in the fabrication and ground testing of the life raft system.
- No special training devices or equipment shall be required to train Government personnel.

e. Equipment Publications

- Appropriate sections from existing technical publications and maintenance task sheets from MEA's will be used in lieu of new publications development.
- Maintenance and operational checklists will be prepared as required.

f. Facilities

- Existing facilities shall be used for support.
- g. Transportation, Packaging, Storage, and Handling (TPSH)
 - Special reusable containers shall not be required.
 - TPSH requirements will be satisfied by the most economical accepted commercial practices.

3. MANAGEMENT SUPPORT PLAN

3.1 SCOPE

This plan describes the Contractor's management of the Life Raft System's Program support activities. The objective of this plan is to define a program of management, scheduling control, and liaison to ensure effective and efficient logistic support throughout the Life Raft Development and Production Program.

3.2 MANAGEMENT RELATIONSHIPS

The contractor's Integrated Logistic Support (ILS) management interfaces are shown in Figure 1. The H-46/107 Manager,

, is charged with the overall responsibility for the contractor's H-46 activities. The PILS/Product Assurance Manager,

is responsible for integration of all ILS activities and is the primary point of customer contact within the branch on all life raft logistic support matters.

3.3. MANAGEMENT PROCEDURES

The plan provides for the accomplishment of five key management tasks:

- a. PILS Revision
- b. Government Liaison
- c Engineering Change Control Support
- d. Scheduling Control and Status Reporting
- e. Vendor/Supplier Participation

3.3.1. PILS Revisions

Boeing/Vertol shall prepare and submit revisions as required.

3.3.2. Government Liaison

Liaison with the Government shall be conducted on a continuing basis. When problems arise which affect logistics integration, the Government PILS Project Officer will be so advised.

3.3.3. Change Control Support

The Boeing/Vertol PILS Manager or his designated representative shall ensure that all configuration changes which evolve during design, development, fabrication, and testing can be adequately supported prior to commitment. Additionally, he shall take required action to update the PILS and implement required logistic support actions.

3.3.4. Scheduling Control and Status Reporting

Scheduling control and status reporting shall be an integral part of the Contractor's Cost and Schedule Control System (C/SCS). The PILS Manager shall monitor PILS activities and ensure compliance with established schedules. He shall report noncompliance or foreseen delays and problems with amplifying information and recommendations for schedule recovery.

3.3.5. Vendor/Supplier Participation

Boeing/Vertol shall include applicable PILS requirements in procurement specifications and source control drawings, and shall be responsible for all aspects of support for Contractor-Furnished Equipment (CFE). In addition, Boeing/Vertol shall require suppliers to provide the drawings and specifications necessary for preparation of Maintenance Engineering Analyses for remove/replace/repair functions and provisioning documentation. Design reviews of supplier items shall be conducted by Boeing to ensure that support for supplier items shall be adequate through out the Life Raft Development Program.



3.4 SCHEDULES

Major plan activities are shown in Figure 2.

4. MAINTENANCE DOCUMENTATION AND ANALYSIS PLAN

4.1 SCOPE

This plan describes the requirements for Maintenance Engineering Analyses (MEA's) and resultant documentation used to attain logistics integration for the Life Raft Development Program. The objective of this plan is to define a program of data and requirements analysis and documentation which will identify and document all support requirements and provide appropriate recording of all logistic events and support usage.

4.2 MANAGEMENT PROCEDURES

There are two key tasks to this plan:

- a. Maintenance Engineering Analysis (MEA) Process
- b. Maintenance Engineering Analysis Documentation

The Product Assurance Maintainability organization shown in Figure 1 shall be responsible for the accomplishment of these tasks. Detail task descriptions are contained in the following paragraphs.

4.2.1 MEA Process

The process described herein shall identify logistics requirements through the analysis of existing data and MEAs documented during the Software Analysis Program. The process shown in Figure 3 contains three critical activities which are described below:

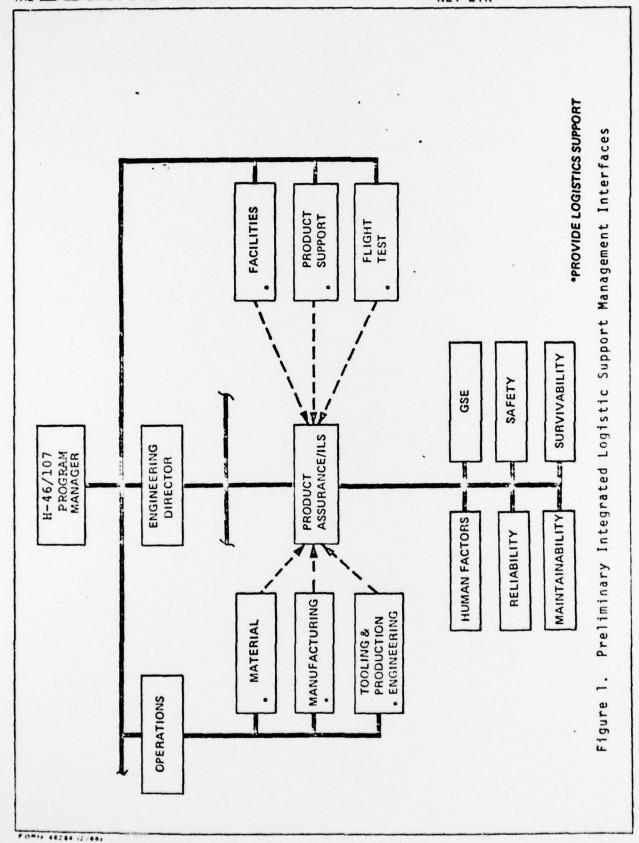
- a. Maintenance Support Concept Definition
- Maintainability Analysis
- Maintenance Engineering Analysis

4.2.1.1 Maintenance Support Concept Definition

The maintenance support concept for the Automated Life Raft System shall be predicated on the following:

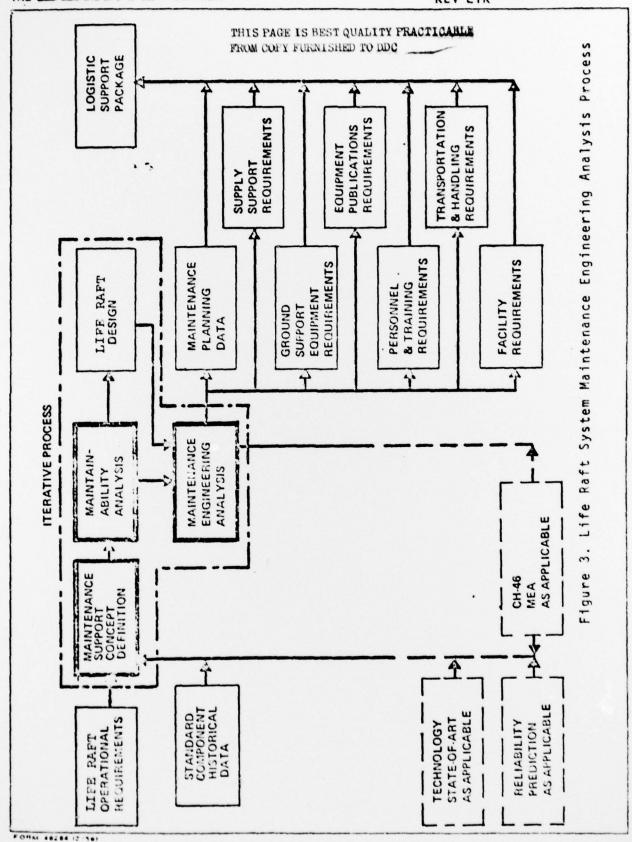
- a. Support concepts identified for major components under the Software Analysis program shall be used.
- b. The Contractor shall provide all Organizational and Direct Support maintenance for the Automated Life Raft System.
- c. The Contractor and/or his subcontractors shall provide General Support and Depot maintenance for Contractor-Furnished Equipment (CFE).
- d. The Government shall provide General Support and Depot maintenance for Government-Furnished Equipment (GFE).

FORM 46284 (2 66)



	D210-11114-1
NO. NO. NO. REVISED REVISED VED VED	THIS PAGE IS BEST QUALITY FRACTICABLE FROM COFY FURNISHED TO DUC
CODE NO. CODE NO. DATE ISSUED. DATE REVISED FREFARED BY APPROVED	
RELICOPTERS	Production Development
AUTOMATICALLY EXPELLED/ LIFE RAFT FOR HELICOPTERS	AFTER GO=AHEAL 1 1
EXTERNALLY MOUNTED, I INFLATED MULTIPLACE L CONTRACT CONTRACT	MONTHS Denomstration Nodel pevel- opnent
EXTERNI INFLATEI	
f 5 f 1.0	ACTIVITY Management Support PILS Revisions MEA Data Summary Report GSE Identification GSE Selection GSE Acquisition GSE Acquisition Acquisition Selection Acquisition Usage Documentation Fraining Concept Equipment & Facility Prep Personnel Training Equipment & Facility Prep Personnel Training Equipment Exacility Prep Personnel Training Equipment Google Typen Romes Identification Deconostration Model Review Support Google Evaluation Support Google Evaluation
	Menagement Supp PILS Revisions MEA Data Summar MEA Data Final GSE Jdentificat GSE Selection GSE Acquisition GSE Acquisition Acquisition Lontification Selection Acquisition Usace Documenta Freining Concep Equipment PUBS PUS Developmen Contract Mainte TPSH Rqmts Iden TPSH Rqmts Iden TPSH Rqmts Iden Maintenance Eva Sub Assembly De Decomonstration Support GOUT Eva

Figure 2. Schedule of Major Plan Activities



SHEET 14

	BOETHG HE		CCM (DICID DAN	PEDOD	*	
I. JOB CONTROL NO.	BOEING-VE		EST/FIELD RAN		J. DATE	
1. JOB CONTROL NO.	7. A.C SERL	L NO.	J. A.C. IDEAL.		1. 0.12	
A.C HOEL	6. A C FEIGH	IT HELS.	7. OWNER		8 .	
4. WIEN DISCOVERED	10. AIRCHAPT		II. DESCRIPTION		PANY/SYMPTOM	or
J. HEP CHE	A. 20112 B. 20112	-				
b. DURENG	I. ELECTRIC					
C. AFTER	LA HICH PRINT					
d. GROUND	1. HO * 200	T	-			
B. SCHEFULED	- CACCAGO		7			
INSPECTION	1. AVIONIES					
MAINTENANCE						
TY SAPETY OF PLICIT	FYECTES. Yes	_ до				
A. AIR ABORT: Yes_	No					
b. GROUND DELAY, CALCE		Ko				
Explain in Alock II	all items chec	red Aeri	REPORTED BY			
			REPORTED BY	\$10	NATURE	-
D. CAUSE OF DISCREPA	NEW AND CONTRO	outing F	CTOC .			
			PILOT/NECHA	NIC		
A. CORRECTIVE ACTION					TONATURE	
b. DATE				510	SNATURE	
IA. ELAPSED MAINT.	***************************************		TIE. TOTAL MAINT.		Soun II	
TIME: MINUTES	PERSONNEL	i	NAN MINUTES:		TIME:	
19. ACCESSIBILITY	DOUL T POOR		20. TBO ITEM	MELL		
21. DISCREPANT PART N	CHENCLATURE	27. NEXT	HIGHER ASSEMBLY		SITION OF DIS	CREPANT
				PART		

22. PART NO.		29. GROU	NO SUPPORT EQUIPME	NT REQUIRE	D TEST I	<u>o</u> 1
2). MANIFACTURER		. DESC	RIBE COUIPMENT USES			
24. SEPTAL NO.						
25. OPERATISC HOURS		10. a. HE	PLACEMENT PART NO.			
B. SINCE NEW	UC	b. RE	PLACED NT PART SER	IAL NO.		
76. DATE INSTALLED			RVISOR'S ATURE			

Figure 4. Boeing · Vertol Test/Field R & M Report Form

Sheet 15

THIS PAGE IS BEST QUALITY PRACTICABLE FROM COPY FURNISHED TO DDC

- All on-aircraft modifications shall be performed at the Contractor's facility or test site as selected by the Navy.
- 4.2.1.2 Maintainability Analysis

Qualitative and quantative maintainability design requirements shall be established in accordance with the maintenance support concept. These requirements (i.e., accessibility, replaceability, interchangeability, repairability, etc.; and quantitative measures of time, rate, and manpower) shall be identified to the equipment designer and included in procurement specifications. Continuous informal and formal design reviews shall be established to ensure that maintainability requirements are satisfied as design progresses.

4.2.1.3 Maintenance Engineering Analysis (MEA)

Maintenance Engineering Analyses shall be performed to determine logistic resources requirements and to verify the inclusion of maintainability requirements in the equipment design. These analyses shall provide:

- Detailed identification of maintenance tasks
- Frequency of tasks
 Personnel quantity and skill level requirements c.
- Elapsed time for task performance
- Identification of parts, supplies, and support equipment required
- 4.2.2 MEA Documentation

The results of the MEA shall be documented to provide the basis for Integrated Logistic Support development. This documentation shall be used to define the following logistic support requirements:

- a. Maintenance Tasks and Task Times
- b. Maintenance Manbower
- Maintenance Training c.
- d. Ground Support Equipment
- e. Supply Support
- f. Transportation and Handling
- Facilities g.
- Technical Publications h.

Documentation will be limited to those tasks performed on the aircraft, i.e., isolate fault, remove and replace, repair in place, adjust, check-out, and preventive maintenance tasks.

4.2.2.2 MEA Documentation Control

The documentation shall be manually prepared, indexed, and maintained on file.



4.2.2.3 MEA Documentation Verification

The MEA documentation shall be verified by the actual performance of maintenance in accordance with the MEA documented procedures. The verification procedures are described in Paragraph 11.0, Maintenance Evaluation Plan.

4.3 SCHEDULES

Major plan milestones are shown in Figure 2.

5. SUPPORT EQUIPMENT PLAN

5.1 SCOPE

Should ground support equipment (GSE) other than shop tools, equipment and devices readily available, be required for use with the Automated Life Raft System. A Support Equipment Plan will be promulgated.

6. REPAIR PARTS AND SUPPLY SUPPORT PLAN

6.1 SCOPE

Should a "Repair Parts and Supply Support Phase" other than life raft repair materials and container repair materials, electrical wiring, etc, be required for use with the Automated Life Raft System, a plan will be promulgated.

7. TRAINING PLAN

7.1 SCOPE

This plan describes the Contractor's methods of identifying and satisfying the Life Raft's System training requirements. The objective of this plan is the definition of a program which shall provide timely and adequate training for Government personnel with minimum requirements for training aids and facilities.

7.2 MANAGEMENT PROCEDURES

This plan provides for the accomplishment of three key tasks:

- a. Development of training concept
- b. Definition of training equipment and facilities
- d. Personnel training

Methods of accomplishment are detailed in subsequent paragraphs.



7.2.1 Development of Training Concept

The training provided Government personnel shall make use of data, test results, and operational experience gained through all phases of the program.

Course durations and material developed and organized for training Contractor personnel shall be used, with appropriate modification and updating, for training Government personnel. Major emphasis shall be placed upon on-the-job training (OJT) with instruction provided, where practicable, by the Contractor personnel who perform the tasks for which training is provided.

7.2.2 Definition of Training Equipment and Facilities

The Contractor shall design and provide training devices and equipment to facilitate the training under separately negotiated contracts.

8. EQUIPMENT PUBLICATIONS PLAN

8.1. SCOPE

Should an "Equipment Publications Plan be required for use with the Automated Life Raft System, a plan will be promulgated.

9. SPECIAL TEST FACILITIES

No special test facilities, other than those in possession of **Boe**ing, will be required except for special Navy testing at remote locations.

10. CONTRACT MAINTENANCE PLAN

10.1 SCOPE

This plan describes the Contractor's methods for satisfying the requirements for aircraft and equipment maintenance during the Automated Life Raft Program. The objective of this plan is to define a program of Government and Contractor maintenance responsibilities which shall ensure effective maintenance management and support of the Life Raft System and a Navy H-46 helicopter.

10.2 MANAGEMENT PROCEDURES

The plan provides for the accomplishment of three key tasks:

- a. Maintenance of Navy
- b. Maintenance of Contractor-Furnished Equipment (CFE)
- c. Maintenance of Government-Furnished Property (GFP)

The Product Support Maintainability organization shall be responsible for the establishment of maintenance procedures and the Vertol Division Flight Test Maintenance organization shall be responsible for the accomplishment of maintenance. Management relationships are shown in Figure 1. Detailed descriptions of the key tasks are contained in the following paragraphs.

10.2.1 Maintenance of Navy H-46 helicopter.

The Contractor shall perform the following Organizational and Direct Support maintenance, including Quality Assurance, as identified by Maintenance Engineering Analysis (MEA).

10.2.1.1 Preventive Maintenance

The Contractor shall perform all required servicing and inspections as described by MEA. Inspections identified as maintenance requirements are:

a. Daily inspections shall be accomplished subsequent to the last flight of the day, or preceding the next day's flying.

Discrepancies discovered during inspections shall be documented and corrected as described in paragraph 10.2.1.2.

10.2.1.2 Corrective Maintenance

The Contractor shall correct discrepancies noted during ground test, flight, and inspection as necessary for safety of flight corrective action shall be identified by the Contractor for other discrepancies, but implementation may be deferred at his discretion. The corrective action taken shall be performed in accordance with the procedures listed in the applicable MEA's. All discrepancies and corrective action will be documented on the Boeing-Vertol TEST/FIELD R&M REPORT form, Figure 4. Discrepancies or recommended improvements in the maintenance procedures shall also be documented on this form.

10.2.2 Maintenance of CFE

The Contractor shall be responsible for the required General Support and Depot level maintenance of CFE. This maintenance may be performed at the supplier's facilities at the option of the Contractor.

10.2.3 Maintenance of GFP

The contractor shall perform the Organizational and Direct Support Maintenance authorized by the applicable GFP maintenance allocation chart. This maintenance shall be documented on the Boeing-Vertol TEST/FIELD R&M REPORT form. Should higher level maintenance be required, a DD Form 611-1, GFE REJECTION FAILURE DATA, shall be completed and returned with the item of GFP to the Government. The Government shall provide a like serviceable item.

10.3 SCHEDULES

Major milestones are indicated in Figure 2.

11. MAINTENANCE EVALUATION PLAN

11.1 SCOPE

This plan describes the Contractor's methods for the accomplishment of the Life Raft System maintenance evaluation.

The objective of this plan is to define a program of maintenance evaluation by the Contractor and the Government which shall assess the Life Raft System maintenance characteristics and provide a basis for maintainability considerations in subsequent phases of the Life Raft System Development.

11.2 MANAGEMENT PROCEDURES

There are three key tasks to this plan:

- a. Contractor maintenance evaluation and documentation
- b. Maintenance orientation and demonstration
- c. Government maintenance evaluation support

The Maintainability Organization shown in Figure 1 shall be responsible for the accomplishment of these tasks and the implementation of this plan. Detail task descriptions are contained in the following paragraphs. (See Figure 3 for MEA process).

11.2.1 Contractor Maintenance Evaluation and Documentation

The MEA's are the Contractor's initial assessment of maintenance. These analyses are based on evaluation of engineering drawings and specifications performed in conjunction with analysis of data from existing studies and define quantitative and qualitative maintenance requirements for the system. During the Automated Life Raft Program the Contractor performs maintenance in accordance with procedures established in the MEA. Maintenance actions shall be documented on the Boeing Vertol TEST/FIELD R&M REPORT form shown in Figure 4. These reports shall be evaluated by the Contractor and used to verify and update MEA documentation and to provide a basis for maintainability and reliability design improvements. Comments and actions taken shall be noted on the back of the form. These reports shall be indexed and filed with the applicable MEA and shall be available for review by Government personnel. Additionally, the actual performance of complex maintenance tasks shall be witnessed by Contractor Maintainability personnel and MEA's shall be updated as required.

11.2.2 Maintenance Orientation and Demonstration

The Contractor shall demonstrate to Government personnel selected maintenance tasks and associated special tools and Ground Support

Equipment, if such equipment is developed.

11.2.3 Government Evaluation Support

11.2.3.1 Maintenance Support

The Contractor shall make available the following data to facilitate Navy evaluation of the overall maintenance aspects of the system.

- a. MEA's
- b. Test/Field R&M Reports
- c. Support Equipment List
- d. Supply List

In addition, Contractor Maintainability engineers shall be available for consultation with Government personnel as necessary.

11.2.3.2 Technical Support

The Contractor shall provide for necessary technical support, if required.

11.3 SCHEDULES

Major plan milestones are indicated in Figure 2.

12. TRANSPORTATION, PACKAGING, STORAGE AND HANDLING (TPSH) PLAN

12.1 SCOPE

This plan describes the contractor's methods for identifying and satisfying TPSH requirements for the Automated Life Raft System. The objectives of this plan are to define a program for identifying items requiring special TPSH design considerations and provide their characteristics to the Government, and providing TPSH support for the Automated Life Raft System Developmental Program.

12.2 MANAGEMENT PROCEDURES

The plan provides for the accomplishment of two key tasks:

- a. Identification of equipment TPSH design requirements
- b. Developmental Program TPSH support

Methods of accomplishment and contingent responsibilities are detailed in subsequent paragraphs.

12.2.1 Identification of Equipment TPSH Design Requirements

Equipment TPSH design requirements, including reusable containers, shall be identified by maintenance and spares engineering analyses of maintenance, maintenance and storage locations, maintenance

frequency, transportation modes and interfaces, human factors and safety factors.

12.2.2 Prototype Program TPSH Support

The Contractor shall clean, preserve, and package Contractor-Furnished Equipment (CFE) by the most economical means in accordance with accepted commercial practices.

12.3 SCHEDULES

Major plan milestones are indicated in Figure 2.

13. LIFE CYCLE COST CONSIDERATIONS

13.1 SCOPE

In order to adequately summarize the projected investments and operating costs associated with logistic support for the project, from the beginning through its first ten years of operational life, acquisition costs for a prototype system must be determined. The Conceptual Configuration Evaluation Study, when completed, will provide basic dollar values and a sound basis for total dollar investment and operating costs.

- 14. LOGISTIC SUPPORT FOR OPERATIONAL AND MISSION REQUIREMENTS
- 14.1 SCOPE To be determined.